

# Christiana Care Section of Cardiology: FY 11 Annual Report

**Chief of Cardiology:**

William S. Weintraub, MD

**Associate Chief of Cardiology:**

Ehsanur Rahman, MD

**Associate Chief of Cardiology, Wilmington Campus:**

Arthur Colbourn, MD

Cardiology Medical Directors	
Medical Director, Cardiac Rehab	Anthony B. Furey, DO
Medical Director, Cardiovascular Screening & Prevention	Edward Goldenberg, MD
Medical Director, Cardiac Cath Lab	James T. Hopkins, MD
Associate Medical Director, Cardiac Cath Lab	Jonathan W. Kamen, DO
Associate Medical Director, Cardiac Cath Lab	Wasif A. Qureshi, MD
Medical Director, Cardiology Education	John J. Kelly, MD
Medical Director, Electrophysiology Research	Roger Kerzner, MD
Medical Director, Coronary Intensive Care Unit	Gilbert A. Leidig, MD
Medical Director, Heart Failure	Mitchell T. Saltzberg, MD
Medical Director, Electrophysiology Lab & Heart & Vascular Interventional Services	Brain H. Sarter, MD
Medical Director, Cardiology Research	Michael E. Stillabower, MD
Medical Director, Clinical Decision Units	Henry L. Weiner
Unit Based Medical Director, HVIS Prep & Hold	Christopher Kittle, MD
Medical Director, Pulmonary Hypertension	Gerald O'Brien, MD
Medical Director, Adult Congenital Heart Disorders	Wolfgang Radtke, MD
Medical Director, Non-Invasive Lab	Erik S. Marshall, MD

## Cardiology Routine Meetings and Conferences

### Monthly

- ✓ 2<sup>nd</sup> Monday 0700 – Cardiovascular Clinical Trial Program Committee Meeting (Angie Disabatino-Research)
- ✓ 3<sup>rd</sup> Monday 1100 – Heart Code Case Review Meeting (Maria Albert-Performance Improvement)
- ✓ 3<sup>rd</sup> Monday 1230 – Cardiology Advisory Meeting (William Weintraub-Cardiology)
- ✓ 3<sup>rd</sup> Tuesday 0730 – Non-Invasive Conference (Erik Marshall-Non Invasive)
- ✓ 1<sup>st</sup> Wednesday 0700 – Cath/Interventional Cardiology Teaching Conference (James Hopkins-Cardiology)
- ✓ 2<sup>nd</sup> Wednesday 0700 – Cardiovascular Grand Rounds (William Weintraub-Cardiology)
- ✓ 3<sup>rd</sup> Wednesday 0700 – Cardiology Section Meeting (William Weintraub-Cardiology)
- ✓ 4<sup>th</sup> Wednesday 0700 – Cardiovascular Grand Rounds (William Weintraub-Cardiology)
- ✓ 5<sup>th</sup> Wednesday 0700 – Cath/Interventional Cardiology Peer Review Conference (James Hopkins-Cardiology)
- ✓ 1<sup>st</sup> Friday 0730 – Non-Invasive Conference (Erik Marshall-Non Invasive)
- ✓ 1<sup>st</sup> Friday 0700 – EP Attending Meeting (Brian Sarter-Cardiology)
- ✓ 2<sup>nd</sup> Friday 0700 – Cardiac CT Conference (Mandip Gakhal-Radiology)
- ✓ 3<sup>rd</sup> Friday 1100 – Cardiovascular Outcomes Research Meeting (William Weintraub-Cardiology)

### Bi-Monthly

- ✓ 4<sup>th</sup> Friday 1300 – ACC Database Adjudication Meeting (James Hopkins/William Weintraub-Cardiology)

### Quarterly

- ✓ 1<sup>st</sup> Monday 1200 – ED/Cardiology Meeting (Weintraub/Reese/Ellicott)
- ✓ 2<sup>nd</sup> Thursday 0830 – Practice Administrators Meeting (Leslie Mulshenock-Cardiology)
- ✓ 3<sup>rd</sup> Friday 0830 – USA/MI & Chest Pain Guidelines Team Meeting (Joseph West-Cardiology)

### Other

- ✓ 2<sup>nd</sup> Friday 0700 – EP Case Review Conference (M&M) (odd months) (Brian Sarter-Cardiology)
- ✓ 5<sup>th</sup> Friday 0700 – Cardiology Education Committee (William Weintraub/Eshanur Rahman-Cardiology)

### Yearly

- ✓ February 1200 – Cardiovascular Grand Rounds Committee Meeting (William Weintraub-Cardiology)

## Cardiology Grand Rounds Speakers & Topics

Date	Speaker & Institution	Topic
7/14/10	Agusto Pichard, MD Washington Hospital Center	“Percutaneous Aortic Valves”
8/11/10	Glen Tinkoff, MD CCHS	“Medical Simulation at CCHS: VEST and the Mentice Endovascular Simulator
9/22/10	Mitchell Saltzberg MD and Timothy Manzone, MD CCHS	“Cardiac Sympathetic Innervation: Evaluation and Implication”
10/13/10	Mark Creager, MD Brigham & Women’s Hospital	“Peripheral Atherosclerotic Vascular Disease: New Treatment Strategies for the Cardiovascular Specialist”
10/27/10	Spencer King, MD St. Joseph’s Heart & Vascular Institute	“What is the Role of PCI in Stable Ischemic Heart Disease”
11/10/10	Howard S. Weintraub, MD NYU, Center for the Prevention of Cardiovascular Disease	“Mixed Dyslipidemia & residual Cardiovascular Risk: Therapeutic Considerations”
12/8/10	Pamela Douglas, MD Duke University Medical Center	“New Paradigms in Imaging for Coronary Artery Disease Diagnosis”
2/9/11	C. Noel Bairey Merz, MD Cedars Sinai Medical Center	“Women and Ischemic Heart Disease: Paradox and Pathophysiology”
2/23/11	Harsh Jain, MD CV Surgery, CCHS	“Mechanical Circulatory Support - Options for Advanced Heart Failure”
3/9/11	William Weintraub, MD Section of Cardiology, CCHS	“Comparative Effectiveness”
3/23/11	William E. Boden University of Buffalo	“The Clinical Impact of COURAGE After ~4 Years: Lessons Learned... Has Practice Changed?”
4/13/11	Andra Popescu, MD Cardiology Fellow, CCHS	“Bridging Cardiology and Oncology”

Date	Speaker & Institution	Topic
4/27/11	Leonid Mandel, MD Cardiology Fellow, CCHS	“Patent Foramen Ovale: Management in the Adult”
5/11/11	Zeshan Rana, MD Cardiology Fellow, CCHS	“Carotid Stenosis: To Stent or Not to Stent”
5/25/11	Lee Goldberg, MD University of Pennsylvania	“Patient Selection for Mechanical Circulatory Support: Before It’s Too Late”
6/8/11	G. Robert Myers, MD Interventional Cardiology, CCHS	"Left Main Revascularization a New Era?"
6/22/11	Matthew Grove, DO Cardiology Fellow, CCHS	“Contemporary Approach to Renal Artery Stenosis”

## Fellowship Program

### FY 10-11 Fellows Rooster

Last	First	Certification	Fellowship Year
Ali	M. Asad	MD, PhD, MPH	FY-1
Copeland	Kevin	DO	FY-1
Rajamanickam	Anitha	MD	FY-1
Reddy	Vivek	MD	FY-1
Zhang	Yuanyuan	MD, PhD	FY-1
Bheemreddy	Swarna	MD	FY-2
Abraham	Niksad	MD	FY-2
Zhu	Daming	MD, PhD	FY-2
Grove	Matthew	DO	FY-3
Mandel	Leonid	MD	FY-3
Popescu	Andra	MD	FY-3
Rana	Zeshan	MD	FY-3
Myers	G. Robert	MD	FY-4: Interventional Fellow
Morrone	Doralisa	MD	Research Fellow

## Abstracts & Presentations

Niksad Abraham, Daming Zhu, Doralisa Morrone, Angela DiSabatino, Dan Murphy, Andrew Doorey: Efforts to Decrease the Door to Balloon Time Might Increase the Incidence of Unnecessary Emergency Cardiac Catheterization and Delay Appropriate Care; **ACC 2011**

Niksad Abraham, Daming Zhu, Doralisa Morrone, Angela DiSabatino, Dan Murphy, Andrew Doorey: Efforts to Decrease the Door to Balloon Time Might Increase the Incidence of Unnecessary Emergency Cardiac Catheterization and Delay Appropriate Care; **ACC 2011**

Daming Zhu, Nowwar G. Mustafa, Angela Hoban, Dan Murphy, Susan King, Maria Albert, William S. Weintraub, Ehsanur Rahman: Comprehensive Strategy Including Exclusive Involvement of Interventional Cardiologist in the Decision Making Process Decreases Door-to-Balloon Time in STEMI: **Presented at ACC 2011**

Publication. Zhu D, Kumar A, Weintraub WS, Rahman E. A large pheochromocytoma with invasion of multiple local organs. Accepted and to be published by Journal of Clinical Hypertension. J Clin Hypertension 2011, Jan: 13 (1): 60-4.

Zhu D, Mustafa NG, Hoban A, Murphy D, King S, Albert M, Weintraub WS, Rahman E. Comprehensive Strategy Including Exclusive Involvement of Interventional Cardiologist in the Decision Making Process Decreases Door-to-Balloon Time in STEMI. Poster presented at 2011 ACC, 04/2011, New Orleans, Louisiana.

Niksad Abraham, Daming Zhu, Doralisa Morrone, Angela DiSabatino, Dan Murphy, Andrew Doorey: Efforts to Decrease the Door to Balloon Time Might Increase the Incidence of Unnecessary Emergency Cardiac Catheterization and Delay Appropriate Care; **ACC 2011**

Daming Zhu, Nowwar G. Mustafa, Angela Hoban, Dan Murphy, Susan King, Maria Albert, William S. Weintraub, Ehsanur Rahman: Comprehensive Strategy Including Exclusive Involvement of Interventional Cardiologist in the Decision Making Process Decreases Door-to-Balloon Time in STEMI: **Presented at ACC 2011**

Publication. Zhu D, Kumar A, Weintraub WS, Rahman E. A large pheochromocytoma with invasion of multiple local organs. Accepted and to be published by Journal of Clinical Hypertension. J Clin Hypertension 2011, Jan: 13 (1): 60-4.

Zhu D, Mustafa NG, Hoban A, Murphy D, King S, Albert M, Weintraub WS, Rahman E. Comprehensive Strategy Including Exclusive Involvement of Interventional Cardiologist in the Decision Making Process Decreases Door-to-Balloon Time in STEMI. **Poster presented at 2011 ACC, 04/2011, New Orleans, Louisiana.**

Kevin A. Copeland, Vinay R. Hosmane, Claudine Jurkovitz, Paul Kolm, James Bowen, Jon F. Strasser, Michael K. Banbury, Timothy J. Gardner, William S. Weintraub, Andrew J. Doorey: Frequency of Severe Valvular Disease Caused by Mediastinal Radiation Among Patients Undergoing Valve Surgery in a Regional Academic Medical Center, **ACC 2011**

Hisham M.F. Sherif, Ehsanur Rahman, Nowwar Mustafa, Vinay R. Hosmane, Vivek Reddy, William Weintraub, Angela DiSabatino. Recovery after Resuscitation from Cardiac Arrest in ST-Elevation Myocardial Infarction: A Computer-Based Medical Decision-Support Tool. Abstract accepted to Medicine Meets Virtual Reality Conference, Long Beach, California, January **2009**.

Rajamanickam, Anitha; Risk of hemorrhage on dual antiplatelet therapy with Coumadin; Presented at SCAI **2011**

Rajamanickam, Anitha; A Comprehensive and user-friendly online calculator for predicting the risk of contrast induced nephropathy (CIN); Presented at SCAI **2011**

Rajamanickam, Anitha; Risk of permanent hemodialysis after cardiac catheterization for contrast for contrast induced nephropathy (CIN), Presented at SCAI **2011**

Rajamanickam, Anitha; Is Creatine Kinase-MB (CKMB) Really Necessary in the Diagnosis of Acute MI When Troponin Is Performed Simultaneously?; Presented at QCOR **2011**

Zhang, Yuanyuan, Rajamanickam, Anitha; Pre-hospital ECG Can Shorten Door to Balloon Time in Patients with STEMI; Presented at SCAI **2011**

Asad Ali, Yuanyuan Zhang, Dan Murphy, Angela Hoban, Susan King, Maria Albert, Angela DiSabatino, William S. Weintraub, Ehsanur Rahman, Christiana Health Care System, Newark, DE; Improved Systems Result in Reduced Door to Balloon Time in Both Males and Females and Gender Differences may Disappear; Presented at **ACC 2011**

Asad Ali, Yuanyuan Zhang, Dan Murphy, Angela Hoban, Susan King, Maria Albert, Angela DiSabatino, William S. Weintraub, Ehsanur Rahman, Christiana Health Care System, Newark, DE; Improved Systems Result in Reduced Door to Balloon Time in Both Males and Females and Gender Differences may Disappear; Presented at **ACC 2011**

Zhang, Yuanyuan, Rajamanickam, Anitha; Pre-hospital ECG Can Shorten Door to Balloon Time in Patients with STEMI; Presented at SCAI **2011**

Zhang, Yuanyuan; Gender Difference Seems to Disappear with Strategies to Improve Overall Door to Balloon Time; Presented at QCOR **2011**

Grove, Matthew, Doorey, Andrew J; Rapid Electrocardiographic Diagnosis of Myocardial Infarction for Off-Site Interventionalists; presented at SCAI **2011**

**Popescu AM**, Weintraub WS - Outpatient Percutaneous Coronary Interventions: Hospital and Health System Costs Saving While Maintaining Patient Safety – *JACC Cardiovasc Interv.* 2010 Oct;3(10):1020-1

Marcoff, L, **Popescu, AM**, Lee, LR, Leidig, GA, Clay, AW, Kelly, JJ, Rahman, E: Spontaneous Coronary Artery Dissection in a Postpartum Woman Presenting with Chest Pain. *Am J Emerg Med* 2010 28(8):980-1

**Popescu AM** , Leidig LA, Marcoff L, Murphy D, Weintraub WS, Rahman E - Transient No Reflow/Slow Flow During Elective Percutaneous Coronary Interventions is Rarely Associated With Early, In-Hospital Complications. – accepted to ACC 2011

**Popescu AM**, Marcoff L, Leidig LA, Murphy D, Weintraub WS, Rahman E: Is it Safe to Discharge Patients on the Same Day after Elective Percutaneous Coronary Intervention? ACC 2010

The Cardiology 3 year fellowship program welcomes new fellows in July. Two of the graduating fellows are filling two interventional fellowship slots within the program, Matthew Grove and Leonid Mandel. Goals for the upcoming year include restructuring the request process for data to try and streamline resources and requests for fellowship publications and adding a heart failure fellowship to the program.

## **Ehsanur Rahman, MD**

**Associate Chief of Cardiology**

**Associate Program Director, Cardiology Fellowship, Jefferson University/Christiana Care Health Systems**

### **Publications:**

Marcoff L, **Rahman E**: *Menstruation-Associated Spontaneous Coronary Dissection: A Case Report and Review of Literature*. **J Invasive Cardiol** (in press).

Marcoff, L, Popescu, A, Lee, LR, Leidig, GA, Clay, AW, Kelly, JJ, **Rahman, E**: *Spontaneous Coronary Artery Dissection in a Postpartum Woman Presenting with Chest Pain*, **Am J Emerg Med** (2010) 28:641e5-641e7.

Zhu D, Kumar A, Weintraub WS, **Rahman E**.; A large pheochromocytoma with invasion of multiple local organs. *Journal of Clinical Hypertension*. **J Clin Hypertension** 2011, Jan: 13 (1): 60-4.

### **Abstracts:**

Marcoff L, Jurkovitz CT, Murphy D, Kolm PG, Bowen JR, Weintraub WS, **Rahman E**: *More Restenosis Seen In the Aftermath of the Controversy Over Late Thrombosis of Drug-Eluting Stents*. **Circulation: Cardiovascular Quality and Outcomes** 2010; **Circ Cardiovasc Qual Outcomes**, May 2010

Popescu AM, Marcoff L, Leidig GA, Murphy D, Weintraub WS, **Rahman E**; *Is it Safe to Discharge Patients on the Same Day after Elective Percutaneous Coronary Intervention?*: **J Am Coll Cardiol** 2010; 55(10); Supplement 1:A19

Marcoff L, Jurkovitz CT, Murphy D, Kolm PG, Bowen JR, Weintraub WS, **Rahman E: Drug-Eluting Stent Use Continues to Decline, Especially in Acute Myocardial Infarction, Despite Resolution of the Controversy over Late Thrombosis: J Am Coll Cardiol 2010; 55(10); Supplement 1:A191**

Marcoff L, Jurkovitz CT, Murphy D, Kolm PG, Bowen Jr, Weintraub WS, **Rahman E: The Aftermath of the Controversy: Drug-Eluting Stent Use Declines; More Restenosis is Seen, ESC Congress, Stockholm, Sweden, August, 2010**

Asad Ali, Yuanyuan Zhang, Dan Murphy, Angela Hoban, Susan King, Maria Albert, Angela DiSabatino, William S. Weintraub, Ehsanur Rahman, Christiana Health Care System, Newark, DE; **Improved Systems Result in Reduced Door to Balloon Time in Both Males and Females and Gender Differences may Disappear**; Presented at ACC 2011

Daming Zhu, Nowwar G. Mustafa, Angela Hoban, Dan Murphy, Susan King, Maria Albert, William S. Weintraub, Ehsanur Rahman: **Comprehensive Strategy Including Exclusive Involvement of Interventional Cardiologist in the Decision Making Process Decreases Door-to-Balloon Time in STEMI**: Presented at ACC 2011

## **William S. Weintraub, MD**

**Chief of Cardiology**

**Director, Christiana Center for Outcomes Research**

### **Academic Honors:**

2011	American College of Cardiology Distinguished Service Award
2011	President Elect of the Great Rivers Affiliate of the American Heart Association

### **Publications:**

Maron DJ, Boden WE, O'Rourke RA, Hartigan PM, Calfas KJ, Mancini GB, Spertus JA, Dada M, Kostuk WJ, Knudtson M, Harris CL, Sedlis SP, Zoble RG, Title LM, Gosselin G, Nawaz S, Gau FT, Blaustein AS, Bates ER, Shaw LJ, Berman DS, Chaitman BR, Weintraub WS, Teo KK for the COURAGE Trial Research Group. Intensive multifactorial intervention for stable coronary artery disease: optimal medical therapy in the COURAGE Trial. J Am Coll Cardiol 2010;55:1348-1358.

Teo KK, Sedlis SP, Boden WE, O'Rourke RA, Maron DJ, Hartigan PM, Dada M, Gupta V, Spertus JA, Kostuk WJ, Berman DS, Shaw LJ, Chaitman BR, Mancini GBJ, Weintraub WS on behalf of the COURAGE Trial Investigators. Optimal medical therapy with or without percutaneous coronary intervention in older patients with stable coronary disease: a pre-specified subset analysis of the COURAGE (Clinical Outcomes Utilizing Revascularization and Aggressive drug Evaluation) Trail. J Am Coll Cardiol 200;54:1303-1308.



Weintraub WS. Do More Cardiac Rehabilitation Visits Reduce Events Compared to Fewer Visits? *Circulation* 2010;121:8-9.

Culler SD, Weintraub WS. Is Initiating Employees on Atorvastatin a Good Buy for Employers? In press, Mayo Clinic Proceedings.

Hosmane VR. Mustafa NG. Reddy VK. Reese CL IV. DiSabatino A. Kolm P, Hopkins JT. Weintraub WS. Rahman E. Survival and neurologic recovery in patients with ST-segment elevation myocardial infarction resuscitated from cardiac arrest *J Am Coll Cardiol* 2009;53:409-415

Klein LW. Kolm P. Xu X. Krone RJ. Anderson HV. Rumsfeld JS. Brindis RG. Weintraub WS. A longitudinal assessment of coronary interventional program quality: a report from the American College of Cardiology- National Cardiovascular Data Registry. *JACC Cardiovasc Interv* 2009;2:136-143.

Chan PS. Soto G. Jones P. Nallamothu BK. Zhang Z. Weintraub WS. Spertus J. Patient health status and costs in heart failure: insights from the Eplerenone's Neurohormonal Efficacy and Survival Study (EPHESUS). *Circulation* 2009;119:398-407.

Mosca L. Arnett DK. Dracup K. Hansen BC. Labarthe DR. Marks JS. Matthers KA. Pearson TA. Weintraub WS. Wilson W. Task Force on Strategic Research Direction: Population/Outcomes/Epidemiology/Social Science Subgroup key science topics Report. *Circulation* 2002;106:e167-17.

Kutcher MA. Klein LW. Ou Fang-Shu. Wharton TP. Gehmer GJ. Singh M. Anderson HV. Rumsfeld JS. Weintraub WS. Shaw RE. Sacrinty MT. Woodward A. Peterson ED. Brindis RG. Percutaneous coronary interventions in facilities without cardiac surgery on-site: a report from the National Cardiovascular Data Registry (NCDR). In press, *J Am Coll Cardiol*.

Mancini GBJ. Bates ER. Maron DJ. Hartigan P. Dada M. Gosselin G. Kostuk W. Sedlis SP. Shaw LJ. Berman DS. Berger PB. Spertus J. Mavromatis K. Knudtson M. Chaitman BR. O'Rourke RA. Weintraub WS. Teo K. Boden WE. on behalf of the COURAGE Trial Investigators and Coordinators. Quantitative results of baseline angiography and percutaneous coronary intervention in the COURAGE trial. In press, *J Am Coll Cardiol*.

Marcoff L. Zhang Z. Zhang A. Zhang W. Ewen E, Jurkowitz C. Leguet P. Kolm P. Weintraub WS. Cost-effectiveness of enoxaparin in acute ST elevation myocardial infarction (ExTRACT-TIMI 25). *J Am Coll Cardiol* 2009;54:1271-1279.

Gibbons RJ. Gardner TJ. Anderson JL. Goldstein LB. Mertzner N. Weintraub WS. Yancy CW. *Circulation* 2009;119:2955-2962.

Weintraub WS. Controversies and Opportunities in Economic Analysis in Health Care. *Circulation: Cardiovascular Quality and Outcomes* 2009;2:402-403.

Rao SV, Eikelboom JA, Steg G, Lincoff AM, Weintraub WS, Bassand JP, Gibson CM, Petersen JL, Mehran R, Manoukian SV, Moscucci M, Harrington RA. Toward a consensus definition of bleeding for investigators in acute coronary syndromes. *Am J Cardiol* 2009;158:881-886.

Maron DJ, Boden WE, O'Rourke RA, Hartigan PM, Califf RM, Mancini GB, Spertus JA, Dada M, Kostuk WJ, Knudtson M, Harris CL, Sedlis SP, Zoble RG, Title LM, Gosselin G, Nawaz S, Gau FT, Blaustein AS, Bates ER, Shaw LJ, Berman DS, Chaitman BR, Weintraub WS, Teo KK for the COURAGE Trial Research Group. Intensive multifactorial intervention for stable coronary artery disease: optimal medical therapy in the COURAGE Trial. *J Am Coll Cardiol* 2010;55:1348-1358.

Teo KK, Sedlis SP, Boden WE, O'Rourke RA, Maron DJ, Hartigan PM, Dada M, Gupta V, Spertus JA, Kostuk WJ, Berman DS, Shaw LJ, Chaitman BR, Mancini GB, Weintraub WS, on behalf of the COURAGE Trial Investigators. Optimal medical therapy with or without percutaneous coronary intervention in older patients with stable coronary disease: a pre-specified subset analysis of the COURAGE (Clinical Outcomes Utilizing Revascularization and Aggressive drug Evaluation) Trial. *J Am Coll Cardiol* 2009;54:1303-1308.

Weintraub WS. Do More Cardiac Rehabilitation Visits Reduce Events Compared to Fewer Visits? *Circulation* 2010;121:8-9.

Peterson ED, Dai D, DeLong ER, Brennan JM, Singh M, Rao SV, Shaw RE, Roe MT, Ho KKL, Klein KW, Krone RJ, Weintraub WS, Brindis RG, Rumsfeld JS, Spertus JA. Contemporary mortality risk prediction for percutaneous coronary intervention: results from 588,398 procedures in the National Cardiovascular Data Registry. *J Am Coll Cardiol* 2010;55:1923-1932.

Zhu D, Kumar A, Weintraub WS, Rahman E. A large pheochromocytoma with invasion of multiple local organs. *The Journal of Clinical Hypertension*. 2011;13:60-64.

Ziemer DC, Kolm P, Weintraub WS, Vaccarino V, Rhee MK, Twombly JG, Narayan KMV, Koch DD, Phillips LS. Glucose independent, black-white differences in hemoglobin A1c levels. *Annals Intern Med* 2010;152:770-777.

Roe MT, Messenger JC, Weintraub WS, Cannon CP, Fonarow GC, Dai D, Chen AY, Klein LW, Masoudi FA, McKay C, Hewitt K, Brindis RG, Peterson ED, Rumsfeld JS. Treatments, trends and outcomes of acute myocardial infarction and percutaneous coronary intervention: a report from the National Cardiovascular Data Registry (NCDR). *JACC* 2010;56:254-263.

Chaitman BR, Hartigan PM, Booth DC, Teo KK, Mancini GB, Kostuk WJ, Spertus JA, Maron DJ, Dada M, O'Rourke RA, Weintraub WS, Berman DS, Shaw LJ, Boden WE. Do Major cardiovascular outcomes in patients with stable ischemic heart disease in COURAGE differ by Healthcare System? *Circulation: Cardiovascular Quality of Care and Outcomes* 2010;3:476-483.

Myers RG, Weintraub WS. Revascularization strategies for patients with CAD and diabetes mellitus. *Nature Reviews Cardiology* 2010;7:364-366.

Krone RJ, Rao SV, Dai D, Brindis RG, Klein LW, Shaw RE, Weintraub WS. Utilization of drug eluting stents in the United States from 2003 to 2008. A report from the American College of Cardiology/National Cardiovascular Data Registry (ACC/NCDR®). In press, *A Am Coll Cardiol: Intervention*.

Popescu A, Weintraub WS. Outpatient Percutaneous Coronary Interventions: Hospital and Health System Costs Saving While Maintaining Patient Safety. In press, *J Am Coll Cardiol: Cardiovascular Interventions*.

Elliott D, Weintraub WS. Population-based health requires population-based change. In Press, *Journal of Pediatrics*.

Greenland P, Alpert JS, Beller GA, Benjamin EJ, Budoff MJ, Fayad ZA, Foster E, Hlatky MA, Hodgson J McB, Kushner FG, Lauer MS, Shaw LJ, Smith SC, Taylor AJ, Weintraub WS, Wenger NK. 2010 ACCF/AHA guideline for assessment of cardiovascular risk in asymptomatic adults. *Circulation* 2010;122:2748-2764.

Zhang Z, Kolm P, Boden WE, Hartigan PM, Maron DJ, Spertus JA, O'Rourke RA, Shaw LJ, Sedlis SP, Mancini GBJ, Berman DS, Dada M, Teo KK, Weintraub WS. The cost-effectiveness of percutaneous coronary intervention as a function of angina severity in patients with stable angina. *Circulation Quality and Outcomes* 2011;4:172-182

Weintraub WS, Karlsberg RP, Tcheng JE, Bustin AE, Heidenreich P, Boris J, Hendel RC, Dove JT, Jacobs AK, Fonarow GC, Lewis W, Goldberg LR, Mirro MJ, Shahian DM. ACC/AHAA key data elements and definitions of a base cardiovascular vocabulary for electronic health records: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Clinical Data Standards (Writing Committee to Develop Clinical Data Standards for Adult Cardiovascular Electronic Health Records). In Press *J Am Coll Cardiol/Circulation* 2011;124:103-123.

Weintraub WS, Daniels S, Burke LE, Franklin B, Goff DC, Hayman L, Lloyd-Jones D, Pandey DK, Sanchez E, Parsons Schram A, Whitsel LP. The Value of Primordial and Primary Prevention for Cardiovascular Disease. In Press, *Circulation*.

Maron DJ, Boden WE, Spertus JA, Hartigan PM, Mancini GBJ, Sedlis SP, Kostuk WJ, Chaitman BR, Shaw LJ, Berman DS, Dada M, Teo KK, Weintraub WS, O'Rourke RA, for the COURAGE Trial Research Group. Impact of metabolic syndrome and diabetes on prognosis and outcomes with early percutaneous coronary intervention in the COURAGE (Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation) Trial. *J Am Coll Cardiol* 2011;58:131-137.

Camm AJ, Breithardt G, Crijns H, Dorian P, Kowey P, Le Heuzey JY, Merioua I, Pedrazzini L, Prystowsky EN, Schwartz PJ, Torp-Pedersen CH, Weintraub W. Real-Life Observations of Clinical Outcomes with Rhythm- and Rate-Controlled Therapies for Atrial Fibrillation. *J Am Coll Cardiol* 2011;58:493-501.

## **Abstracts:**

Chin CT, Wang TY, Dai D, Roe MT, Mehta RH, Rumsfeld JS, Anderson HV, Weintraub WS, Messinger JC, Kutcher MA, Brindis RG, Peterson ED, Harrington RA, Rao SV. Trends and predictors of length of stay after primary percutaneous coronary intervention: a report from the National Cardiovascular Data Registry. *J Am Coll Cardiol* 2010;55:A113.

Marcoff L, Jurkovitz CT, Murphy D, Kolm P, Bowen JR, Weintraub WS, Rahman E. Drug-eluting stent use continues to decline, especially in acute myocardial infarction, despite resolution of the controversy over late thrombosis. *J Am Coll Cardiol* 2010;55:A191.

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Popescu Andra, Marcoff L, Leidig GA, Murphy D, Weintraub WS, Rahman E. Is it safe to discharge patients on the same day after elective percutaneous coronary intervention? *J Am Coll Cardiol* 2010;55:A197.

Curtis JP, Geary L, Wang Y, Chen J, Drye EE, Grosso LM, Schreiner F, Sperus JA, Rumsfeld J, Weintraub WS, Normand SLT, Krumholz HM. Development of two registry-based measures suitable for characterizing hospital performance on 30-day all-cause mortality rates among patients undergoing percutaneous coronary intervention. *J Am Coll Cardiol* 2010;55:A197.

Zhang Z, Kolm P, Jurkovitz C, Boden W, Spertus J, Maron D, Hartigan P, Teo K, Weintraub WS. Cost-effectiveness for treating angina by severity of angina at baseline. *J Am Coll Cardiol* 2010;55:A219.

Shaw LJ, Berman D, Maron DJ, Hachamovitch R, Hartigan PM, Min JK, Sedlis SP, Dada M, Mancini GBJ, O'Rourke RA, Spertus JA, Chaitman BR, Bates ER, Teo KK, Boden WE, Weintraub WS. Impact of pretreatment ischemia on therapeutic risk reduction and long-term prognosis in patients with stable angina: results from COURAGE. *J Am Coll Cardiol* 2010;55:A98.

Weintraub WS, Edwards F. Introducing ASCERT: The American College of Cardiology-The Society of Thoracic Surgeons Collaboration on the Comparative Effectiveness of Revascularization Strategies. *J Am Coll Cardiol* 2010;55:A129.

## **Cardiovascular Research**

### **Trial Activity:**

#### **Prospective Protocol for Utilizing Blood Volume Measurements in the Treatment of Heart Failure Patients – Team UF**

**Purpose:** To determine if using blood volume measurement to help guide fluid removal with ultrafiltration in patients hospitalized with decompensated heart failure leads to improved outcomes.

**PI:** Mitchell Saltzberg, MD

**Sub PI:** Timothy Manzone, MD

**Coordinator:** Catherine Wade

**Sponsor:** Daxor

## **VEST**

**Purpose:** The VEST/PREDICTS study is a multi-center randomized controlled trial designed to test a strategy to reduce the early (first 2 months) post-MI sudden death risk, followed by an observational cohort study designed to develop and validate a risk algorithm to determine which patients will most benefit from an ICD 2 months after an MI.

**PI: Michael Stillabower, MD**

**Sponsor: NIH, Zoll Lifecor, Medtronic, GE**

## **Treating to Euvolemia by Clinical Assessment and Measured Blood Volume in Heart Failure (TEAM-HF)**

**Purpose:** To determine if utilization of BVA in addition to standard of care will increase re-hospitalization free survival, decrease all cause mortality, decrease cardiovascular mortality, and improve submaximal exercise capacity and quality of life in patients discharged from the hospital after treatment for acute decompensated heart failure.

**PI: Mitchell Saltzberg, MD**

**Sponsor: Daxor Corporation**

## **Sleep Apnea in HF (ResMed)**

**Purpose:** The purpose of this study is to screen fifty inpatients with heart failure for sleep disordered breathing and document the prevalence of sleep disordered breathing in that population, using a home screening device (ApneaLink) during the patients' hospitalization. The device measures a patient's nasal airflow, pulse oximetry, and heart rate.

**PI: Cliff Hunt, MD**

**Sponsor: ResMed**

## **QuickFlex Lead Model 1258T Left heart pacing lead post approval study**

**Purpose:** To evaluate the acute and chronic performance of the SJM Quickflex LV lead in a patient population indicated for ICD and CRT

**PI: Roger Kerzner, MD**

**Sponsor: St Jude**

## **Left Ventricular Structural Predictors of SCD**

**To determine whether the integrated knowledge of LV size, shape, and myocardial tissue characteristics can be incorporated with demographic, clinical variables, and biomarker levels into a SCD risk score.**

**Purpose:** To determine whether the knowledge of LV heart size, shape, and myocardial tissue characteristics can be incorporated with demographic, clinical variables, and biomarker levels into an SCD risk score that identifies a particularly low risk phenotype for SCD in patients with LVEF  $\leq 35\%$ .

**PI: Michael Stillabower, MD**

**SPONSOR: Johns Hopkins (Dr Wu grant)**

**TAXUS Liberte Registry**

**Purpose:** To compile real-world clinical outcomes data for the TAXUS Liberté Paclitaxel-Eluting Coronary Stent System in routine clinical practice in conjunction with the use of prasugrel and aspirin.

**PI: James Hopkins, MD**

**Sponsor: Boston Scientific**

**Champion Phoenix**

**Purpose:** To demonstrate that in patients requiring PCI cangrelor provides superior efficacy to clopidogrel standard of care as measured by a composite of all cause mortality, MI, Ischemic driven revascularization and stent thrombosis

**PI: Michael Stillabower, MD**

**Sponsor: Medicines Company**

**Evaluation of the Safety and Efficacy of Short-term A-002 Treatment in Subjects with Acute Coronary Syndromes: VISTA-16 (Vascular Inflammation Suppression to Treat Acute coronary syndrome for 16 weeks)**

**Purpose:** To evaluate the safety and efficacy of short-term A-002 treatment on morbidity and mortality when added to atorvastatin and standard of care in subjects with an acute coronary syndrome (ACS).

**PI: Michael Stillabower, MD**

**SPONSOR: Anthera Pharmaceuticals, Inc.**

**UDEL BP Study**

**Purpose:** The aims of this study are to: 1) compare forearm and upper arm oscillometric blood pressures and femoral and aortic arterial pressures in adults undergoing non-emergent cardiac catheterization or coronary intervention; 2) explore the effects of anatomical structures on differences in forearm and upper arm oscillometric blood; 3) compare the characteristics of waveforms in central aortic BP, femoral artery BP, oscillometric forearm and upper arm (brachial artery) BPs; and 4) To explore the relationship of anatomical structures and characteristics of oscillometric BP waveforms in the forearm and upper arm.

**PI: Kathy Schell/Michael Stillabower, MD**

**Sponsor: UDEL**

**Retrieve 2**

**Purpose:** To evaluate the safety and efficacy of the Crux VCF System for the prevention of pulmonary embolism (PE). The primary objective will be assessed for safety and efficacy criteria – Recurrent PE, Filter migration and device related adverse events.

**PI: Mark Garcia, MD**

**Sponsor: Crux Medical**

**Acute Venous Thrombosis: Thrombus Removal with Adjunctive Catheter-Directed Thrombolysis (the ATTRACT Trial)**

**Purpose:** Determine if the initial adjunctive use of Pharmacomechanical Catheter-Directed Thrombolysis (PCDT) in symptomatic patients with acute proximal deep vein thrombosis (DVT) reduces the occurrence of the Post-Thrombotic Syndrome (PTS) over 24 months follow-up.

**PI: Mark Garcia, MD**

**Sponsor: Washington University School of Medicine**

**Sapphire Registry: CAS registry for Cordis**

**Purpose:** Primary objective of this study is to estimate the 30 day MAE rate of stenting (any death, stroke, or MI) with distal protection in the treatment of obstructive carotid artery disease in high risk surgical patients with atherosclerotic disease of the carotid arteries.

**PI: Ashish Parkih, MD**

**Sponsor: Cordis Corporation**

**PEARL II : Peripheral Use of AngioJet® Rheolytic Thrombectomy With a Variety of Catheter Lengths II**

**Purpose:** Prospective, multi-center, observational registry for patients treated with any AngioJet system in PVD

**PI: Mark Garcia, MD**

**Sponsor: Possis**

**TERUMO SFA(OSPREY: Occlusive/Stenotic Peripheral artery Revascularization Study)**

**Purpose:** A Multi-center clinical trial of the Misago™ Self Expanding Stent System for Superficial Femoral Artery to demonstrate that the efficacy and safety of this novel stent design are not inferior to historical PTA and stent outcomes.

**PI: Daniel Leung, MD**

**Sponsor: Terumo**

**CHOICE: Carotid Stenting For High Surgical-Risk Patients; Evaluating Outcomes Through The Collection Of Clinical Evidence.**

**Purpose:** To provide additional information that the commercially available Abbott Vascular Carotid Stent Systems and Embolic Protection Systems can be used successfully by a wide range of physicians under commercial use conditions.

**PI: William Schickler, MD**

**Sponsor: Abbott**

**The IMPACT of BIOTRONIK Home Monitoring Guided Anticoagulation on Stroke Risk in Patients with Implanted ICD and CRT-D devices**

**Purpose:** To investigate the clinical benefit of the combined use of BIOTRONIK Home Monitoring (HM) technology and a predefined anticoagulation plan compared to conventional device evaluation and physician-directed anticoagulation in patients with implanted dual-chamber defibrillators or cardiac resynchronization devices.

**PI: Joseph Pennington, MD**

**Sponsor: Biotronik**

**OptiVol - Effect of information about thoracic impedance values on self-care, heart failure symptoms, and clinical outcomes**

**Purpose:** This will be a randomized controlled pilot study in which the intervention group will be given information about their personal Z values and activity obtained from the OptiVol device and the control group will not be given their Z values or activity data to improve self-care measured objectively with Z scores and activity data from the report as well as subjectively with the Self-Care of HF Index, thereby decreasing symptoms and improving outcomes such as quality of life and the need for HF hospitalization.

**PI: Mitchell Saltzberg, MD**

**Sponsor: Medtronic**

**Pegasus - TIMI 54: A Randomized, Double-Blind, Placebo Controlled, Parallel Group, Multinational Trial, to Assess the Prevention of Thrombotic Events with Ticagrelor Compared to Placebo on a Background of Acetyl Salicylic Acid (ASA) Therapy in Patients with History of Myocardial Infarction (D5132C00001)**

**Purpose:** To compare the effect of long-term treatment with aspirin and ticagrelor vs. placebo on the event rate of the composite of cardiovascular death, non-fatal myocardial infarction (MI), or non-fatal stroke in patients with history of MI and high risk of developing atherothrombotic events. Ticagrelor (AZD6140) is a reversible, potent, oral adenosine diphosphate receptor blocker.

**PI: Andrew Doorey, MD**

**Sponsor: Astra Zeneca**

**SilverSoaker - On-Q Pain control system**

**Evaluation of effectiveness post sternotomy**

**Purpose:** Poor control of surgical pain following cardiac surgical procedures may cause problems after surgery and delay a patient's recovery. This may cause them to have a longer stay in hospital. This study will use the ON-Q SilverSoaker System, a U.S. Food and Drug Administration (FDA) approved disposable infusion pump designed to deliver anesthetic directly to the surgical incision area for up to five days to relieve postoperative pain.

**PI: Heip Nguyen, MD**

**Sponsor: ON-Q**

**V710 Protocol (Merck)**

**Purpose:** Merck randomized, double-blind, study to evaluate the efficacy, immunogenicity and safety of a single dose of Merck 0657nI Staphylococcus aureus vaccine in adult patients scheduled for CT surgery

**PI: John Reinhardt, MD**

**Sponsor: Merck**

**ON-X Low Anticoagulation (PROACT)**

**Purpose:** To test the safety of low dose therapy for anticoagulant therapy in On-X valve patients with low dose therapy consisting of the use of Coumadin in combination with aspirin or the use of antiplatelet therapy alone.

**PI: Ray Blackwell, MD**

**Sponsor: ON-X**



**SCORE (SPIROCOR Coronary Outcome by Respiratory Stress Examination): To validate the accuracy of the SPIROCOR CM-102 system in indicating the presence of significant CAD in subjects with suspected CAD**

**Purpose:** To validate the accuracy of the SPIROCOR System in indicating the presence of significant coronary artery disease (S-CAD) in subjects with suspected S-CAD. The SPIROCOR System is a non-invasive system designed to indicate cardiovascular status based on physiological functionality. The system records and analyzes the data and extracts a Respiratory Stress Response (RSR) value. Low RSR value is related to significant coronary artery disease.

**PI: Michael Stillabower, MD**

**SPONSOR: SPIROCOR**

**RED-CABG Trial - The Effect Of Acadesine On Clinically Significant Adverse Cardiovascular and Cerebrovascular Events In High-Risk Subjects Undergoing Coronary Artery Bypass Graft (CABG) Surgery Using Cardiopulmonary Bypass (Protocol No. P05633): RED-CABG Trial (Reduction in Cardiovascular Events by AcaDesine in Subjects Undergoing CABG)**

**Purpose:** Evaluate whether investigational drug can reduce the risk of developing complications after surgery. The study drug is the first of a new class of agents that improves the supply of nutrients required by the heart tissue to maintain its normal metabolism and function, especially during and shortly after the CABG operation, when stress on heart muscles may occur.

**PI: Michael Banbury, MD**

**Sponsor: Schering-Plough Research Institute**

**ASCEND HF**

**Purpose:** To evaluate whether treatment with nesiritide improves patient outcomes or HF symptoms compared with placebo when each is administered in addition to other standard therapies in subjects with HF

**PI: Mitchell Saltzberg, MD**

**Sponsor: Scios**

**CABANA: CAS registry for BSC**

**Purpose:** To compile early clinical outcomes data for the Carotid WALLSTENT Endoprosthesis and FilterWire EZ System in routine clinical practice.

To evaluate clinical outcomes using the death, stroke, and myocardial infarction (MI) rate  $\leq 30$  days, in total and by center experience tier.

**PI: Ashish Parkih, MD**

**Sponsor: Boston Scientific**

**FY 12 Initiatives:**

- Increasing the partnership with physician directors for patient recruitment into trials to increase enrollment commitments to 90%.
- Increasing fellowship participation in clinical research programs and trials.
- Expand grant efforts with the University of Delaware, the Delaware Health Science Alliance and expand on Campus Collaborations.

- Establish a process for eligible research nurses to take the national Research Certification is also a future goal.
- The ability to break even or become financially viable is another important focus for Trials and Research over the course of the next few years.

## **Outpatient Cardiology Programs**

The Christiana Care Cardiovascular Practice Network was formed in 2011 and combines all of the outpatient practices under one leadership team. This was made possible through the acquisition and employment of the largest cardiology practice group in Delaware in March 2011. This also included the acquisition of three additional community non-invasive laboratories, called the Cardiac Diagnostic Centers (CDC's). The practice network includes Christiana Care Cardiology Consultants, the Outpatient heart Failure Program, the Jennersville Practice and the Wilmington Cardiology Clinic. In April 2011, the practice network established a same day cardiology clinic to prevent patients from being sent to the Emergency Department and also to see heart failure patients within 7 days of discharge from the hospital.

### **Wilmington Practice**

The Wilmington Cardiology Clinic was established in November 2010 and services are provided by Arthur Colbourn MD, Associate Chief of Cardiology for the Wilmington Campus, in conjunction with the Cardiology Fellows. Primary referral resources are the Christiana Care Family Medicine Office and the Wilmington Hospital Health Center and Adult Medicine Office. Current office hours are Tuesday mornings from 9-11:30 on the second floor of Wilmington Hospital. Implementation of the Televox House Calls System was completed in July 2011 for patient appointment reminders and to try and limit the number of no show and canceled appointments being seen. Volumes have increased slowly over the past few months and future initiatives are to increase the publicity of the clinic among residents as well as expand services offered to the wider community.

### **Heart Failure Program**

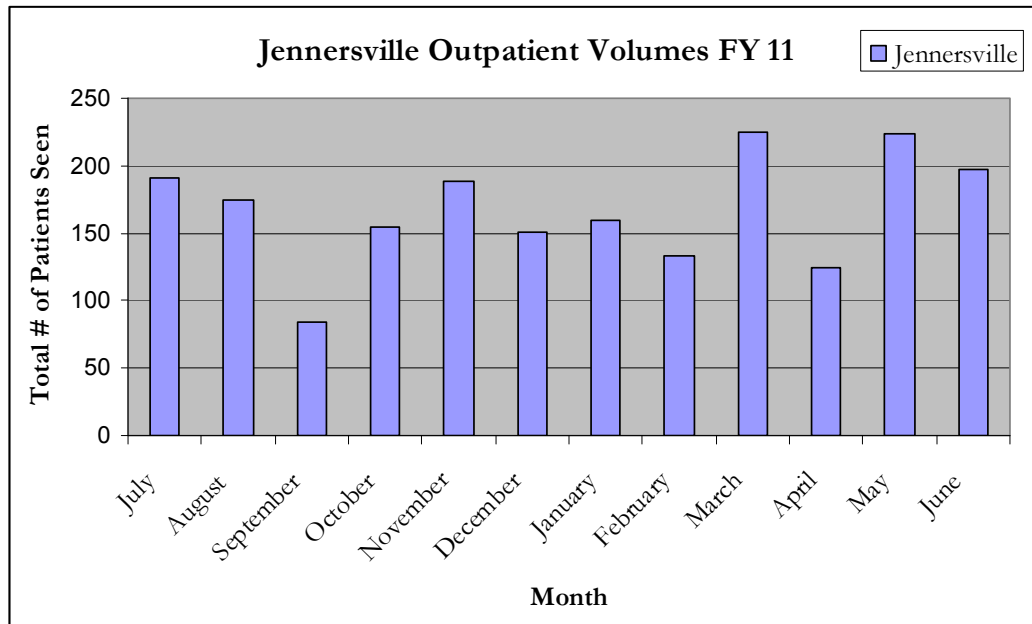
The Heart Failure program was established in 2007 under the direction of Medical Director Mitchell Saltzberg, MD. The program received Joint Commission disease specific certification in April 2011 and was also the recipient of the American Heart Association Get with the Guidelines Gold Quality Achievement Award for the second year in a row. The Ventricular Assist Device Program (LVAD) for Bridge to Transplant and Destination Therapies was launched July 2011 and Joint Commission certification will be sought in the fourth quarter of 2011. Recruitment for an additional Heart Failure physician is underway as is planning for a Heart Failure Fellowship for 2012.

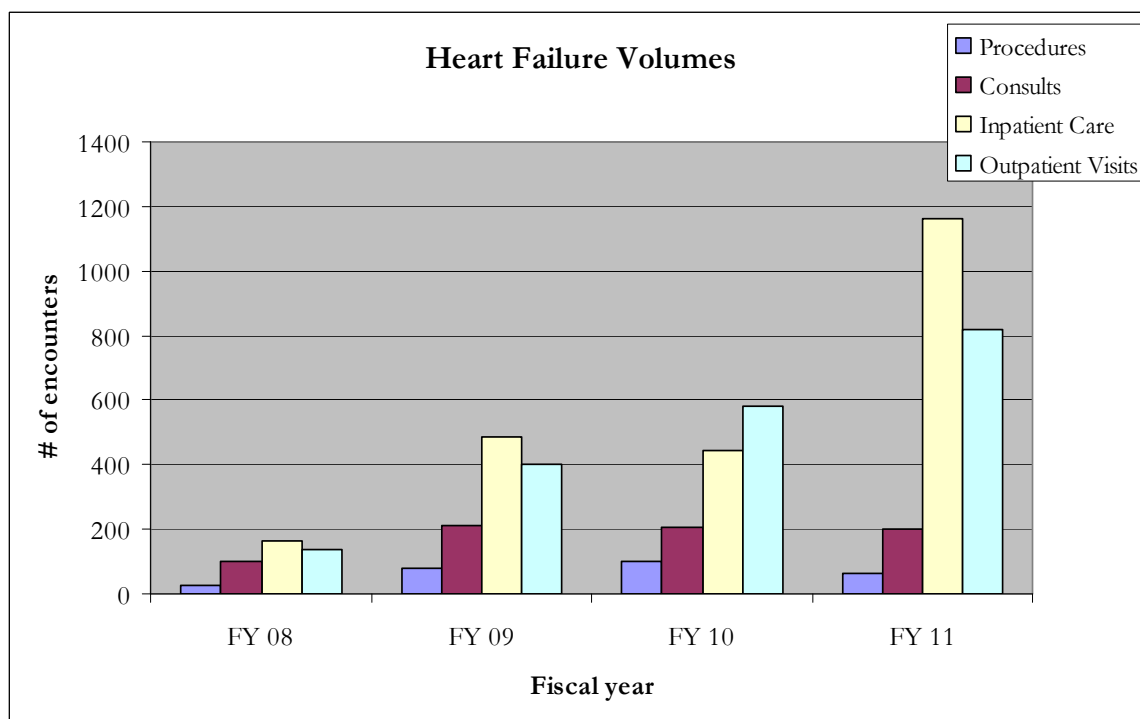
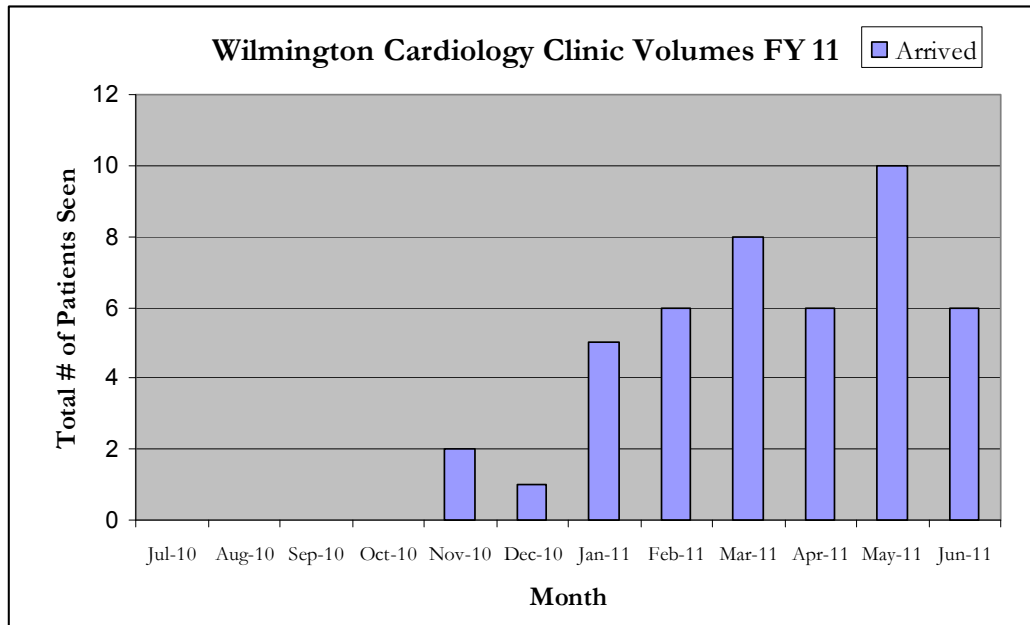
Heart Failure clinic and inpatient volumes continue to increase as the multidisciplinary team actively seeks out and identifies heart failure patients immediately upon their arrival into Christiana Care. The program will continue to move forward with integrating Christiana Care Cardiology Consultants as well as Emergency Department and Hospitalist staff to establish a solid continuum of care for Heart Failure patients.

## Jennersville Practice

The Jennersville Cardiology practice, formerly Heart Care Associates has been in existence long before 1999. In July of 1999, Michael J. Duzy, D.O. came on board and has been the primary Cardiologist serving the Southern Chester County area since then. Now partnered with Heather L. Horton, M.D., PhD, the two doctors aligned with Christiana Care's world-class heart care team in June of 2008. Through the ongoing relationship with Jennersville Regional Hospital and Christiana Care Health System, the most comprehensive, most advanced and highest-quality heart care provided in the region.

Jennersville is a full-service cardiology care provider offering EKGs, Stress echo, 2D echocardiograms, Pacemaker therapy management, Nuclear stress tests and coming soon a full service Coumadin Clinic. The doctors see patients Monday through Friday 9:00 am to 5:00 pm. Diagnostic testing begins at 7:30 am daily. The echocardiography and nuclear labs are the only diagnostic testing facility in the area to be fully accredited by the Intersocietal Commission for the Accreditation of Echocardiography and Nuclear Medicine Laboratories.

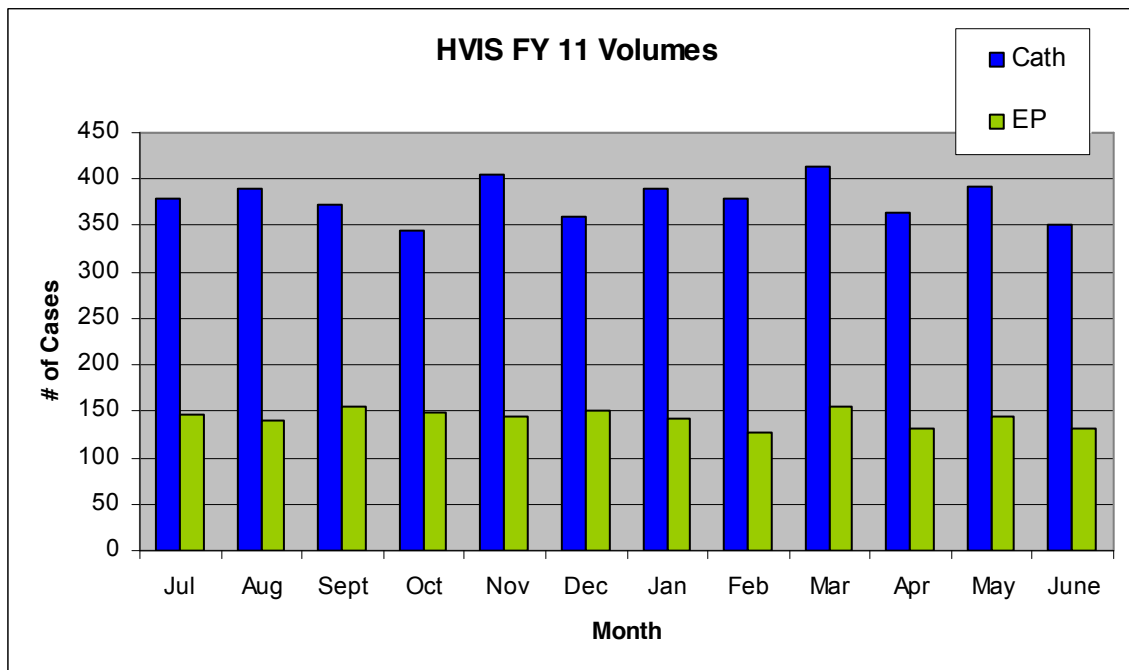
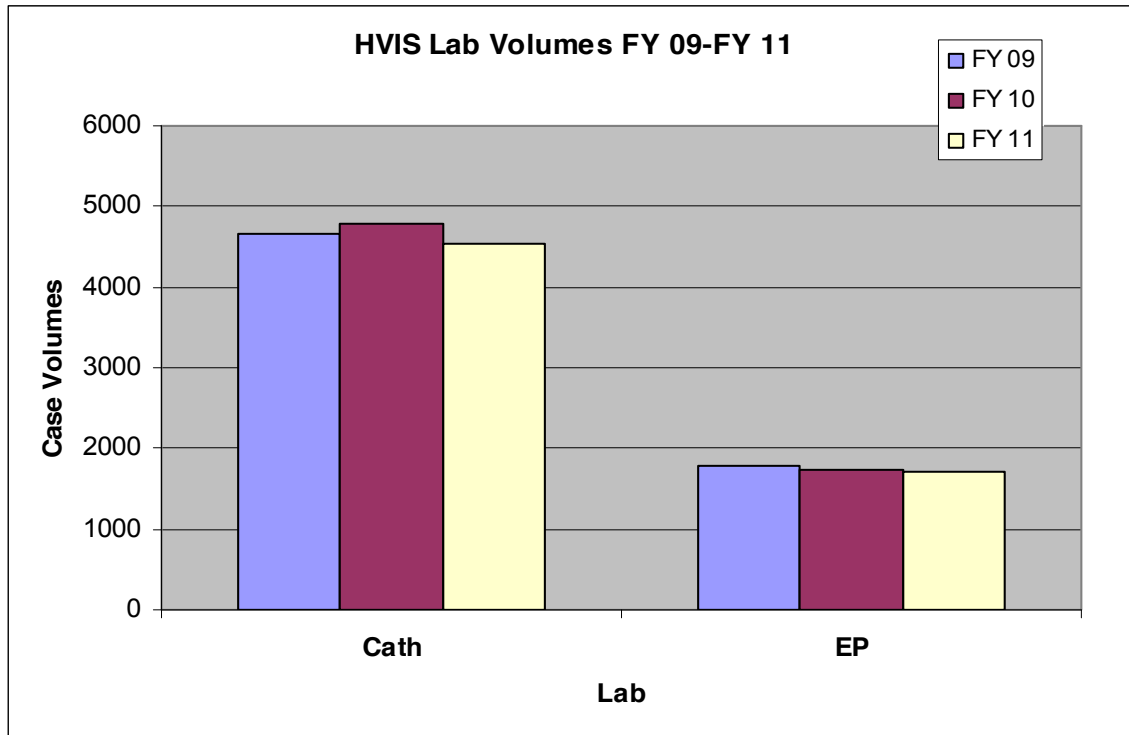




**FY 12 Initiatives:**

- Implement Pinnacle Registry for outpatient cardiology.
- Network the Jennersville Cardiology Practice.
- Establish positive growth with the VAD program and strengthen regional partnerships.
- Implement Press Ganey patient satisfaction surveys for outpatient practices.

## Interventional Services



Heart & Vascular Interventional Services consists of 3 Electrophysiology labs, 4 Cardiac Cath Labs and 1 Peripheral Interventional Lab. Services provided include diagnostic cardiac catheterization, cardiac and peripheral angioplasty and stent placement, device implementations, cardiac arrhythmia treatments and diagnostic electrophysiology studies.

There were many initiatives and accomplishments in interventional services in FY 2011 to address the many changes affecting health care nationwide. A global medical director for the Heart and Vascular Interventional labs was hired to work in collaboration with the Administrative Director to bridge utilization, cost, quality and strategy across all of the procedural areas. An executive committee for services was also created and has since implemented new block time guidelines and a procedural classification system based on acuity to help manage the priority of getting patients to the lab for needed procedures. Significant changes to the coding, billing and payment for cardiac catheterization and electrophysiology services has occurred and a Heart & Vascular Compliance Steer Committee was formed. New processes for compliance monitoring against National Coverage Determinations (NCDs) criteria were implemented for ICDs, VADs, and carotid stents. Appropriate use criteria guidelines are being tracked and reviewed on a routine basis.

Costs savings initiatives including global purchasing contracts were signed with Cardiac Rhythm Device Management vendors and Cath Interventional Lab vendors to decrease costs and increase the variability of products on the shelf available for use. Total estimated savings is \$2 million. The Cath lab also participated in an inventory redesign project to maximize stocking efficiencies as well as eliminate missed items during cases. Over \$12,000 in over and non used stock for coronary guide wires and catheters was eliminated from inventory as was over \$80,000 in peripheral stents across the Cardiac Cath and Vascular Interventional service lines. The Electrophysiology Labs went paper less in August 2011 with the implementation of online case documentation in XIM. Patient satisfaction scores reached the goal of a 95% overall facility rating and the goal of 85% for information provided regarding delays in service.

#### **FY 12 Initiatives:**

- Structured physician reporting for Electrophysiology
- Development & Implementation of a Percutaneous Valve Program (TAVI)
- Saturday operational hours will be implemented for Cardiac Cath procedures in September 2011
- Increase local market share & marketing efforts

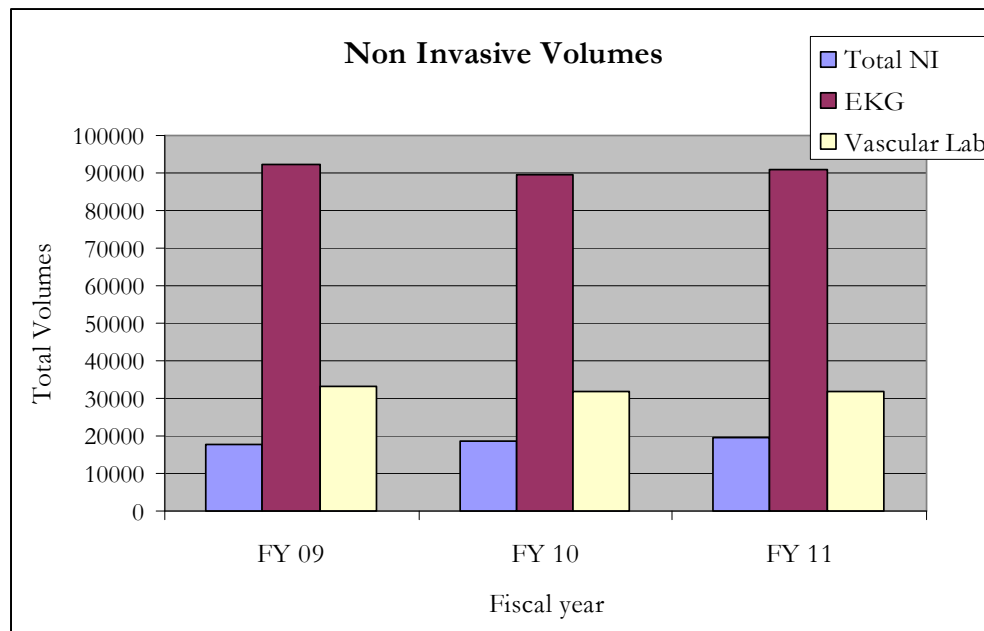
#### **HVIS Prep & Hold**

The Heart & Vascular Prep & Hold is a 37 bed preparation and recovery nursing unit for patients having electrophysiology, cardiac catheterization and interventional radiology procedures at Christiana Hospital. Twenty-three hour patients requiring an observation bed post-procedure stay in the unit's overnight area which keeps a planned maximum census of 8 patients. The unit also performs bedside cardioversions for both outpatient and inpatient populations. Hours of operation are Monday morning through Saturday afternoon. Over the course of this past year, the unit has implemented several changes to process to help with departmental efficiencies including Phase I and II recovery care for post anesthesia patients, Pre-procedure electronic medical documentation, a restructured charge process for Cardioversions and Phase I nursing care, hourly patient

rounding on patients awaiting procedures, post procedure phone calls for patients discharged from the unit and Level C Medication certification for all staff which is the same designation as ICU care units.

## Non-Invasive Services

Nuclear Medicine	Echo Lab	Vascular Laboratory
<u>Intersocietal Commission for the Accreditation of Nuclear Medicine Laboratories</u> Nuclear Cardiology	<u>Intersocietal Commission for the Accreditation of Echocardiography Laboratories</u>	<u>Intersocietal Commission for the Accreditation of Vascular Laboratories</u>
Nuclear Medicine	Adult Transthoracic	Extracranial Cerebrovascular Testing
PET Imaging	Adult Transesophageal	Intracranial Cerebrovascular Testing
<u>Intersocietal Commission for the Accreditation of Computed Tomography Laboratories</u>	Adult Stress Echo	Peripheral Venous Testing
PET/CT		Peripheral Arterial Testing
		Visceral Vascular Testing



<b>PROCEDURE</b>	<b>NUMBER OF PROCEDURES FY09</b>	<b>NUMBER OF PROCEDURES FY10</b>	<b>NUMBER OF PROCEDURES FY11</b>
ECHO	11408	11859	12648
Stress Nuclear	3861	4087	4081
Stress ECHO	631	787	860
TEE	1681	1621	1510
Tilt	313	282	293
<b>Total NI</b>	17894	18636	19392
EKG	92357	89395	90823
Vascular Lab	33361	31914	31891

### **Non-Invasive Services Program Improvements in FY-11**

- The Non-Invasive Lab implemented structured online reporting in Xcelera for Stress Echocardiography, Tilt Table Test, and Holter Monitoring.
- The Non-Invasive Lab implemented block time scheduling with Anesthesiology for high risk patients undergoing Transesophageal Echocardiography (TEE).
- The Nuclear Stress Lab was renovated with enhancements focused on patient safety and privacy.
- Vascular Lab Services now provided at the Christiana Care Springside and Greenville locations.
- Vascular Lab implemented structured on line reporting in Xcelera using a phased in approach.
- Acquisition of three Cardiac Diagnostic Center locations as part of the Cardiology Consultants merger with Christiana Care Health System.
- The Non-Invasive Lab received its three year accreditation from Nuclear Cardiology and Echocardiography.
- Patient Satisfaction scores went from 91.7% overall to 92.2%.

### **FY 12 Initiatives:**

- Expand non-invasive service offerings to include new route 202 location.
- Continue focus on electronic documentation in vascular laboratory and nuclear cardiology.



## Cardiology Data

CCHS continues to participate in the American College of Cardiology National Clinical Data Repository (ACC-NCDR). Participation provides CCHS with National Benchmark data for comparison and statistical analysis of our hospital specific data. The change in equipment in the HVIS has required re-evaluation and modification of the current process to allow for continuance of the ongoing collection and submission of data for ACC which now includes Action Registry for myocardial infarction.

- Apollo data is used in a number of Cardiology and Cardiovascular areas to collect outcome data and provide reports for clinical initiatives as well as feasibility statistics for potential national clinical trial participation. Apollo data further supports numerous local PI and research projects.
- HVIS: Cath Lab. ACC data collected for participation in ACC-NCDR Cath Lab PCI Registry.
- HVIS: Electrophysiology Lab: Data collected intra-procedure for all procedures and post procedure for all implantable cardioverter defibrillator (ICD) implants. Participation in national ACC-NCDR: ICD Registry that meets CMS requirements and enables us to benchmark our ICD performance nationally.
- The Arrhythmia Center has continued to expand and evaluate outcomes. A registry has been developed to evaluate outcomes for Convergence procedures and other surgical treatment options for A Fib. One year data is in the process of being collected.
- Non-Invasive Laboratory: Volume statistics collected for all echo, tilt tests, and peripheral vascular procedures. Apollo also facilitates the required data collection to assist in the Intersocietal Commission on Accreditation of Vascular Laboratories (ICAVL) accreditation.
- Cardiac Rehabilitation performs direct entry into Apollo for their entire patient level data and information. Outcomes and volume reports are generated as well as clinical reports for physician updates on individual patients.

### FY 12 Initiatives:

- Create an informatics structure where it is possible to utilize internal data to look at processes and outcomes.
- Develop an average clinical and economic model for PCI that can be used to predict outcomes and cost.

## **Performance Improvement (PI)**

Currently there are 4 full time employees in PI focused on Cardiology and are assigned to the following registries:

- Heart Code/Heart Alert
- Acute Myocardial Infarction (MI)
- Percutaneous Coronary Intervention (PCI)
- ICD Registry

The Center for Heart and Vascular Health Performance Improvement Committee changed its structure from departments reporting PI projects annually to physician leaders presenting their outcome data and PI projects.

### **FY 11 Initiatives:**

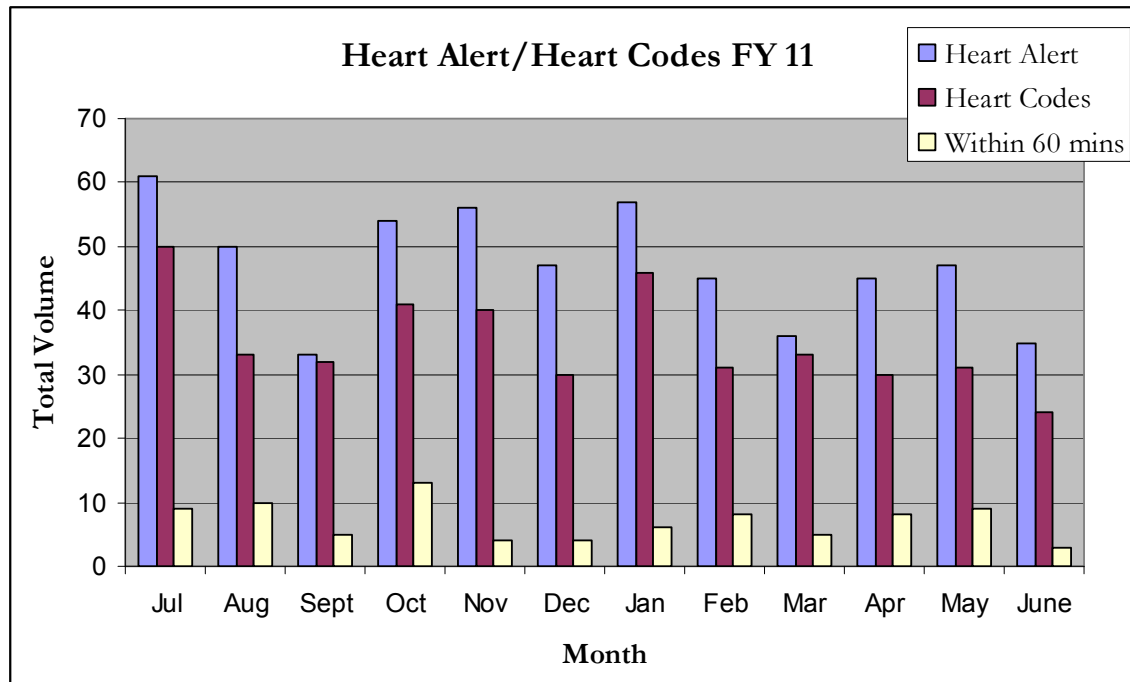
- Reducing door to PCI time to 59 minutes
- MI core measures compliance sustained over 90%
- Heart Failure Core Measures Compliance sustained over 85%
- Supported Heart Failure Disease Specific Certification from Joint

### **FY 12 Initiatives:**

- Disease Specific Certification from Joint Commission for LVAD program
- Improve compliance with Heart Failure Core Measures by 10%
- Commission granted in April 2011

## **Heart Code/Heart Alert Database**

The Heart Alert/Heart Code database manages the data for patients who have an Acute MI (Myocardial Infarction) requiring treatment by emergent Percutaneous Coronary Intervention. Data tracked includes patient time of entry into the system, physician call and response time, time of decision made for treatment, time reperfusion strategy given, final outcome of the patient (discharge, death), and CPR done in field or patient in cardiogenic shock. A major PI initiative in FY 11 was to reduce the door to PCI time for Acute MI patients to 59 minutes or less.



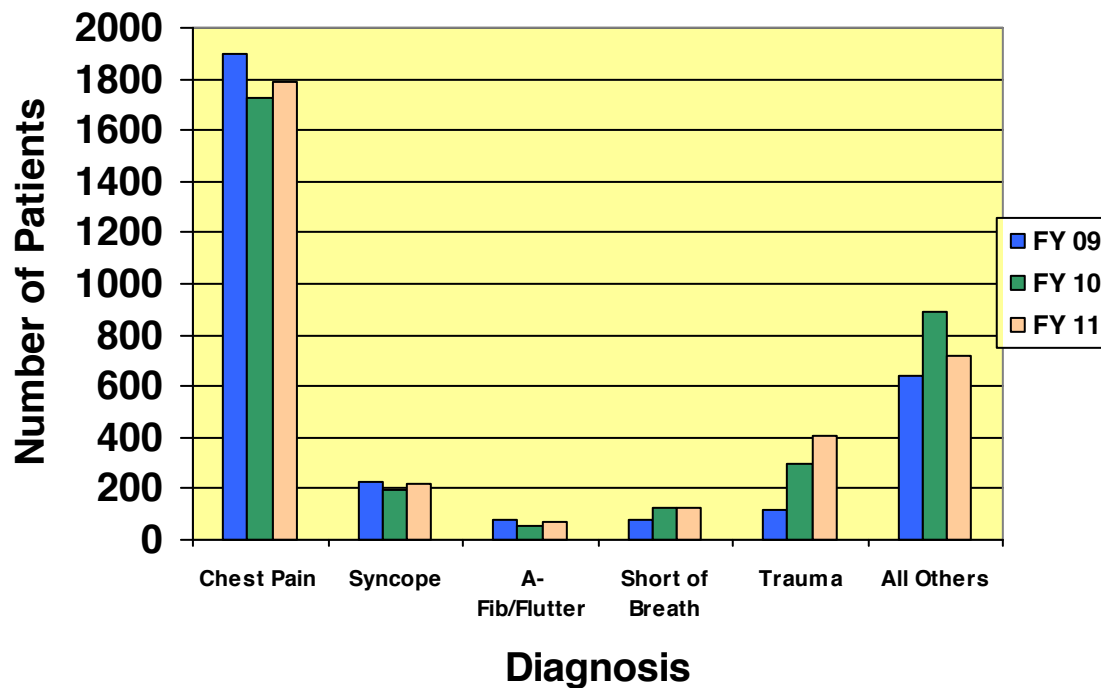
### Center for Heart and Vascular Health: Myocardial Infarction FY 2011

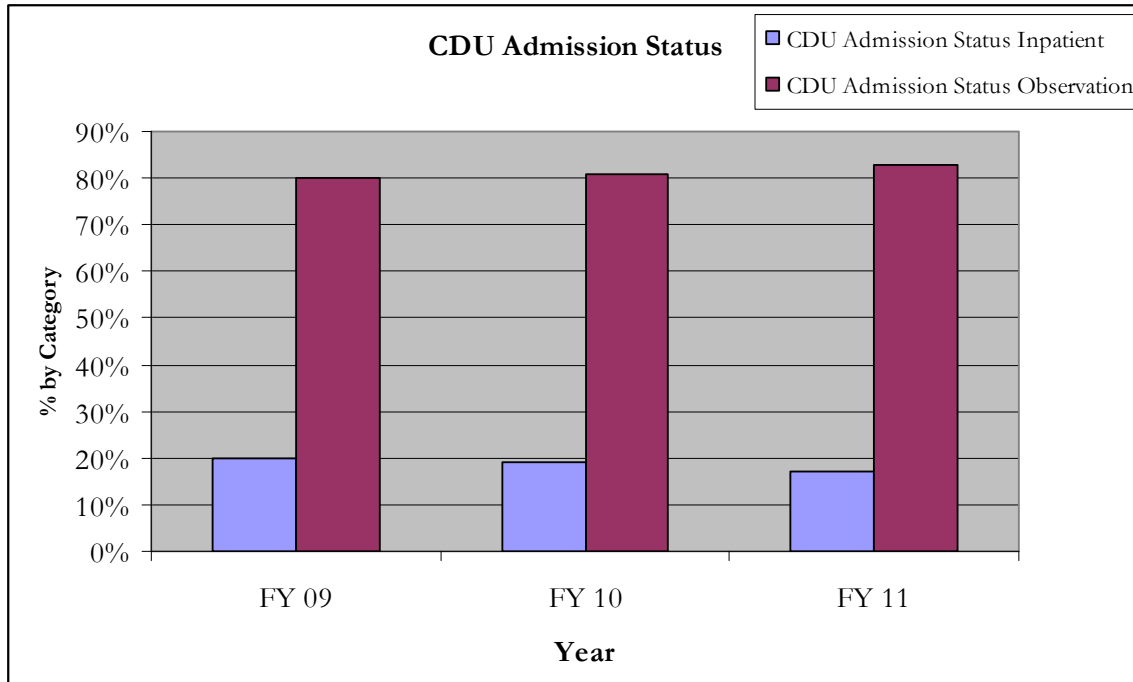
I. General Statistics (Volume)		FY 08	FY 09	FY 10	FY 11	90th Percentile
Inpatients with a principal diagnosis of acute MI		874	892	808	757	na
Mean length of stay (days)		5.7	4.9	4.9	5.1	na
Heart Alert		573	524	642	566	na
Heart Code		425	443	498	421	na
II. Joint Commission Core Measures						
AMI Composite Score		92.6%	92.0%	92.7%	93.8%	na
Aspirin at arrival		99.2%	99.8%	99.2%	99.3%	100.0%
Aspirin at discharge		97.8%	99.2%	98.8%	99.2%	100.0%
ACE Inhibitor or ARB for LVSD		94.9%	97.3%	94.7%	99.2%	100.0%
Smoking cessation advice/counseling		99.6%	100.0%	100.0%	100.0%	100.0%
Beta Blocker at discharge		99.0%	99.7%	98.5%	97.6%	100.0%
PCI within 90 minutes		85.5%	81.8%	90.4%	91.1%	94.5%
III. Outcomes						
Inpatient mortality (Joint Commission Core Measure)		2.5	3.4%	4.6%	5.8%	na
30 day related readmission rate (%)		3.8	3.6%	4.3%	2.1%	Trended

## Clinical Decision Unit (CDU)

Under the direction of Cardiology and Medical Co Directors, Drs. Weiner and Nace, the Clinical Decision Unit is a 20 bed Observation Unit whose admission criteria has progressed from a limited 14 diagnoses to defined exclusionary criteria thereby incorporating a broader range of diagnoses. In 2010, a team of CDU nurses were educated and trained in providing ultrafiltration to qualifying observation patients displaying mild to moderate heart failure. This team is coordinated by CDU staff development specialist, Sharon Vickers, with medical direction and oversight by Dr. Saltzberg and Carolyn Moffa, NP. Year to date the CDU has provided ultrafiltration to 3 patients. Overall CDU observation status volume has grown from 3045 in FY 09, 3284 in FY 10 and 3339 in FY 11 with an average length of stay of 22.6 hours.

### Patients D/C From CDU in Observation Status





#### **FY 12 Initiatives:**

- Decrease length of stay for Chest Pain patients
- Review 30 day readmissions and identify PI strategies for overall reduction.

#### **Coronary Intensive Care Unit (CICU)**

All eight CICU rooms are fully equipped to function as ICU beds and are utilized in that manner. In addition, the eight rooms are also able to meet the needs of patients who quickly progress to an intermediate level of care by providing telemetry monitoring, as was established in the previous CICU. Each room also has its own bathroom for the ambulatory patient.

Nursing care is provided by 100%-RN staff, supplemented by clerical coverage. All nurses are oriented and trained to care for the intensive care patient. This includes offering services such as IABP, SLEDD/c-SLED and Impella VAD care. In addition, the nurses function as part of the Christiana Care Code Blue Team, responding to cardiac and respiratory arrest situations in their code team coverage area. On the weekends, holidays, and at night when HVIS is closed, the CICU nurses provide immediate response to patients in need of the Heart Code system. They care for the patient in the cardiac cath lab, providing assessments, monitoring, and preparing the patient for the procedure while the HVIS on-call team is en route to the hospital.

The CICU is also the site for medical and nursing education and training. Medical residents from the Internal Medicine, Emergency Medicine, and Family Medicine residency programs complete 4-week rotations in the CICU throughout the year as first-year and

second-year residents. They participate in the daily CCU teaching rounds as well as gain experience in the management of acutely ill patients with cardiac disease. Student nurses from the University of Delaware, Delaware Technical & Community College, and Wesley College participate in clinical training in the CICU, working closely with the CICU nurses. Many CICU nurses also function as preceptors for the CCHS Critical Care Nurse Internship Program while nurse interns complete 8-week rotations in this unit.

Forty four percent of the CICU nurses currently maintain national certification in their specialty areas. In addition, thirty three percent of the nurses are enrolled in nursing programs, working to earn BSN or MSN degrees.

## **Cardiac Rehabilitation**

Cardiac Rehabilitation is a program designed to optimize physical and social functioning, reduce the risks of rehospitalization related to coronary artery disease (CAD), control cardiovascular symptoms, halt disease progression, enhance quality of life, and reduce cardiac mortality by 25%. The program involves monitored exercise, risk factor reduction through education and behavioral interventions, psychosocial assessment and outcome measurements. Cardiac rehabilitation is cost effective, providing patients with multiple health benefits at lower costs. Referring a patient to cardiac rehabilitation can help them learn to manage their cardiovascular disease. Cardiac rehabilitation is a standard of care and included in the American Heart Association “Get with the Guidelines” program. The following diagnoses are usually covered within the proceeding 12 months: acute MI, coronary artery bypass grafting, PTCA (s/p stent), stable angina pectoris, heart valve repair/replacement and heart transplant.

Christiana Care cardiac rehab is the only program in New Castle County to be nationally certified by AACVPR (American Association of Cardiovascular and Pulmonary Rehabilitation). Anthony B. Furey DO is the Medical Director, under the direction of Philip Chapman, Center for Heart & Vascular Health and managed by Lisa M. Nellius RN BSN.

Currently there are three convenient locations, Eugene Du Pont Preventive Medicine & Rehabilitation Institute, Glasgow Medical Center and HealthCare Center at Christiana. Referral rate for FY 2011 is 90% and enrollment rate is 65%. National average for enrollment ranges from 20-30%.

FY11 Apollo data reports the effectiveness of program clinical outcome 39% improvement in Met level, behavioral outcome (dietary) 11% and health outcome (QOL) 27%.

CCHS cardiac rehab stays current with AACVPR policy and reimbursement announcement and as of January 2011 had a 68% reimbursement rate for services for Medicare beneficiaries.

Our program is engaged in process improvement projects and in April 2011 went live with an electronic referral management system for creating a seamless referral system to CCHS outpatient locations.

**FY 12 Initiatives:**

- Engage our patients by offering online education for CVD self management.
- Decrease our withdrawal rate.
- Initiate a process for collecting follow up data in Apollo and study adherence to lifestyle changes learned in cardiac rehabilitation.

**Summary**

There has been a lot of activity and many accomplishments to recognize within Cardiovascular Services in the past year and we anticipate both future challenges and successful endeavors to overcome them. ICD 10 diagnosis codes and bundled payment programs are on the horizon as is new technology and the constant mentality to do more with less in regards to health care. With strong administrative and medical leadership on board and working together to provide the best patient care possible, we will continue to strive for innovative care delivery solutions to succeed in the ever changing health care environment.